REMARKS

Claims 1-25 are now pending in the application. Claims 1-25 stand rejected. Claims 15 and 24 are amended as suggested by the Examiner. The Examiner is respectfully requested to reconsider and withdraw the rejection(s) in view of the amendments and remarks contained herein.

35 U.S.C. § 102(b)

Claims 1-9, 11-14, 19-21, 23, and 25 stand rejected under 35 U.S.C. 102(b) based on Wu. This rejection is respectfully traversed.

Applicants' disclose a technique for data recovery and error concealment using data hiding. Particularly, the present invention provides a system and method that uses data hiding techniques to recover or repair the missing or damaged data chunks. The technique involves extracting signature information from one portion of a document and embedding the extracted information in another portion of the document. In particular, independent claim 1 recites "partitioning the digital data into a plurality of blocks; extracting signature information from a first one of said blocks; selecting a second one of said blocks as a masking block; embedding said signature information of said first block in said masking block.

Initially, the Examiner errs in finding that Wu teaches embedding signature information extracted from one portion of a document in another portion of the document. Rather, the portion of Wu cited by the Examiner (i.e., mapping) merely teaches embedding of secondary information. Wu does not teach that the secondary information is extracted from the document into which the secondary information is being embedded.

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Also, Wu should be removed as a reference under 35 U.S.C. § 102(b) because its actual publication date is November of 1999, rather than September of 1999. Thus, it does not qualify as prior art under 35 U.S.C. § 102(b) because it was not published more than one year before the filing of the present application.

Further, public knowledge of the contents of Wu cannot qualify as prior art under 35 U.S.C. § 102(a) because the inventor Heather Yu is a co-author of Wu. Thus, any public knowledge by another can not have occurred before the invention of Applicants' claimed invention. A Statement of Facts executed by Heather Yu and Exhibits A-C accompany the present Paper to substantiate the actual filing date of Wu. The Statement of Facts and Exhibit C also illustrate slides exhibited during a public presentation in September of 1999. Applicant asserts that the slides were not published because of the brevity of display of the slides. Alternatively, even if the slides were published so as to constitute prior art under 35 U.S.C. 102(b), they still do not teach extracting signature information from the document, but rather embedding a phrase (such as "Hello World") in a photograph that does not otherwise contain the phrase.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejections to independent claims based on Wu et al., along with rejection on these grounds of all claims dependent therefrom.

Claims 15-17 stand rejected under 35 U.S.C. 102(b) in view of Chan. This rejection is respectfully traversed.

Independent claim 15 as amended recites, "accessing processor memory containing digital data that has been encoded by: (a) partitioning the digital data into a plurality of blocks; (b) extracting signature information from a first one of said blocks; (c)

selecting a second one of said blocks as a masking block; and (d) embedding said signature information of said first block in said masking block. Chan does not teach accessing data that has been encoded by this process, and the Examiner does not rely on Chan in this capacity. At no point does the Examiner note that Chan teaches extracting signature information from one part of a document into which the signature information is to be embedded in another part.

Accordingly, Applicant's respectfully request the Examiner withdraw the rejection of independent claim 15 on these grounds, along with rejection on these grounds of all claims dependent therefrom.

35 U.S.C. 103(a)

Claims 10, 15, 18, 22, and 24 stand rejected based on Wu in view of Chan. These rejections are respectfully traversed.

Applicants respectfully refer the Examiner to remarks relating to rejection under 35 U.S.C. § 102(b) relating to Wu. Applicants reassert that Wu does not teach extracting signature information from one part of a document into which the signature information is to be embedded in another part. Applicants further reassert that Wu should be removed as a prior art reference. Applicants further note that Chan does not teach extracting signature information from one part of a document into which the signature information is to be embedded in another part, and that the Examiner does not rely on Chan in this capacity.

Therefore, Applicants respectfully request the Examiner withdraw the rejections on these grounds of independent claims 15 and 24 because they recite subject matter similar to that recited in independent claim 1 as detailed above. Applicants further

respectfully request the Examiner withdraw the rejections of claims 10, 18, and 22 based on their dependence from allowable base claims.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: Dec 2, 2004

By: Greg Stobbs

Gregory A. Stobbs
Reg. No. 28,764

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Bloomfield Hills, Michigan 48303
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OIPE JC105 DEC 02 2004 PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Yu et al.	:	
Serial No.:	09/698,712	:	Group: Unknown
Filed:	October 27, 2000	:	Examiner: Jennifer T Nguyen
For:	DATA HIDING IN COMMUNICATION	:	

STATEMENT OF FACTS

Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Sir:

Hong Heather Yu declares as follows based on her personal knowledge:

that she is a co-author of the reference, Wu et al., submitted by Applicants' in an IDS and cited by the Examiner in a previous Office action;

that she erroneously provided a publication date for the reference of September 1999 without deceptive intent;

that the actual publication date for the reference is November 1999 as evidenced at Exhibits A and B;

that she submitted, but did not publish, the reference as a paper at a SPIE conference occurring in September 1999;

that she exhibited slides provided in Exhibit C relating to the paper during a talk at the conference;

that the slides were exhibited one at a time over an approximately twenty-minute period;

that note taking and photography were not prohibited during exhibition of the slides;

that all statements made herein of her own knowledge, are true, and that all statements made on information and belief are believed to be true; and

that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Hong Heather Yu

12/2/200X

Date

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Proceedings of SPIE -- Volume 3845
Multimedia Systems and Applications II, Andrew G. Tescher, Bhaskaran Vasudev, V. Michael Bove, Jr., Barbara Derryberry, Editors, November 1999, pp. 10-21

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Multi-level data hiding for digital image and video

Min Wu
Panasonic Information and Networking Technologies Lab. (USA)

Hong H. Yu and Alex Gelman
Panasonic Information and Networking Technology Lab. (USA)

Previous works on data hiding generally targeted on a specific tradeoff between capacity and robustness. This results in overestimation of the processing noise under some situations and/or underestimation under some other situations, hence limits the overall performance. In this paper, we propose a multi-level data hiding scheme which is able to convey secondary data in high rate when noise is not severe and can also convey some data reliably under heavy distortion. The proposed scheme is motivated by a two-category classification of embedding schemes and by a study on detection performance of spread spectrum watermarking. The multi- level data hiding has been successfully applied to both digital image and video, and can be used for applications such as copy control.

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doi:10.1117/12.371199

Additional Information

Panasonic Technologies, Inc.

Multi-level Data Hiding for Digtal Image and Video

Min Wu[†*] Heather Yu[†] Alex Gelman[†]

[†] Security& E-commerce Group, Panasonic Information and Networking Technologies Laboratory

[*] EE Dept., Princeton University

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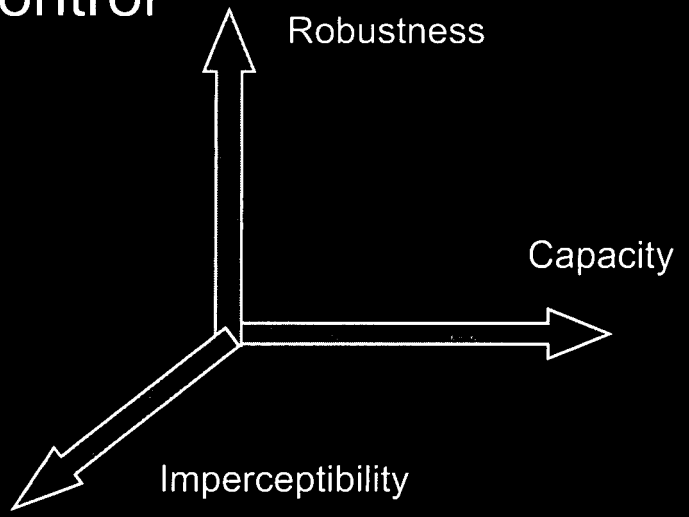
Exhibit C

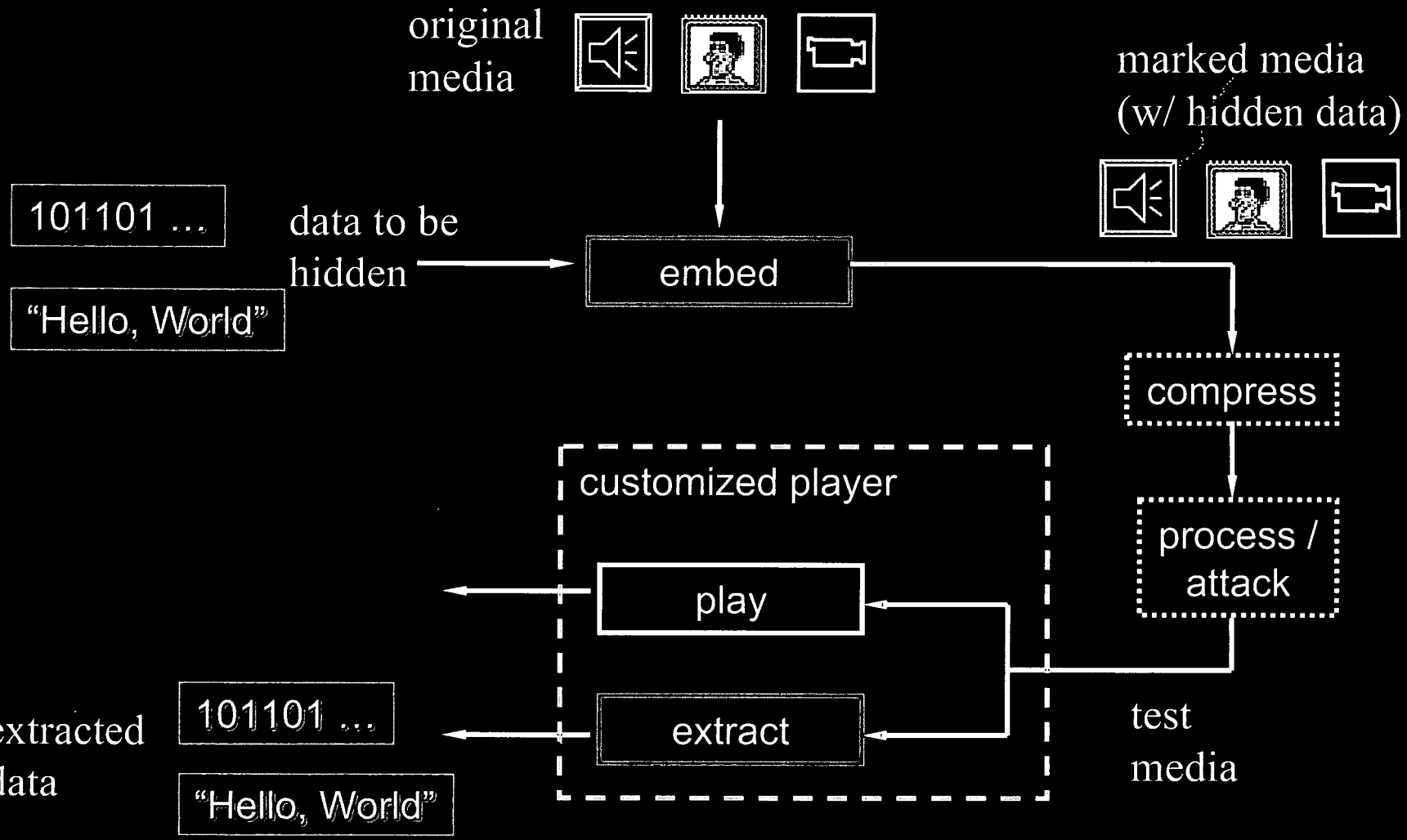
Introduction

- Goal:
  - hide many bits robustly and imperceptibly in digital image and video
- Various usage of hidden data:
  - ownership verification, alteration detection
  - copy control, playback/recording control
- Research challenge:
  - imperceptibility, robustness, capacity (and security)
  - tradeoff between the contradictory requirement



Framework

Panasonic Technologies, Inc.



Outline

- ☑ Human Visual System (HVS)
  - ☞ ensure invisibility
- ❑ Embedding Schemes
  - ☞ multi-level data hiding
- ❑ Experimental Results

Classification of embedding schemes

- Previous classifications:
  - Invisible vs. visible watermarking
  - With vs. without original host signal (blind) detection
- Our proposal:
  - host signal dependent vs. host signal independent

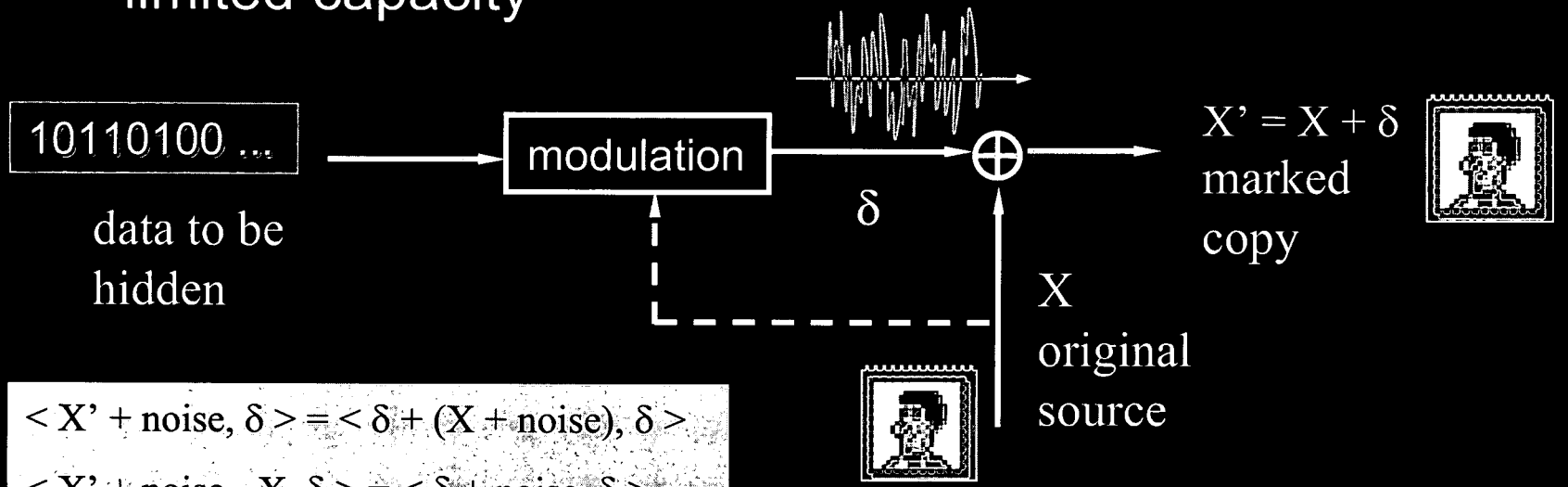
New Classification of Embedding Schemes

- Criterion: knowing host signal helps improve detection?
- Two categories:
  - different robustness-capacity tradeoff

	Type I	*Type II*
Capacity	low	high
Robustness	high	low
Representative	spread-spectrum embedding	odd-even embedding

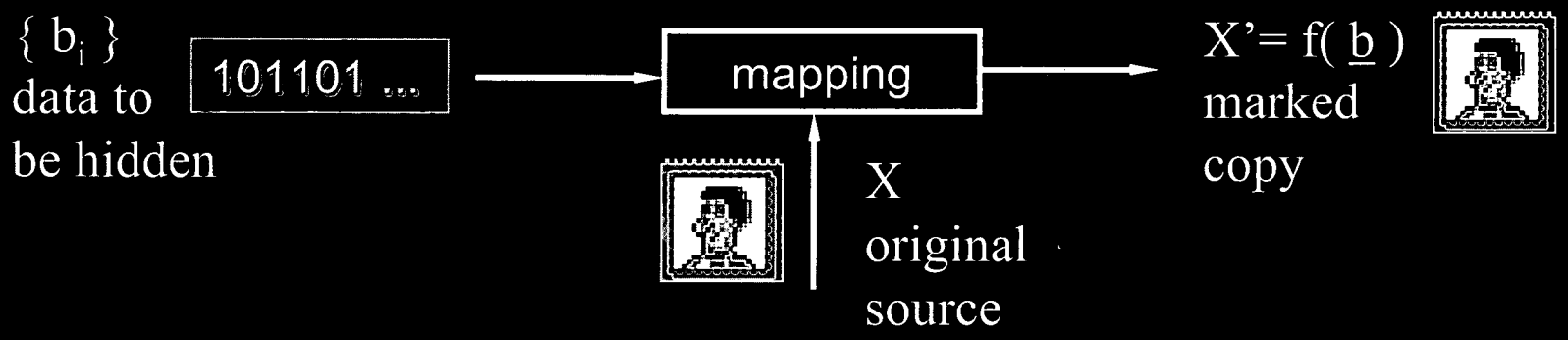
Type-I Embedding

- Inserting secondary signal in host media:
  - host signal serves as major interferer
- Representative: spread spectrum embedding
  - embed a noise-like signal and detection via correlation
  - good tradeoff between imperceptibility and robustness
  - limited capacity



Type-II Relationship Enforcement Embedding

- Enforcing deterministic relationship
  - secondary info. carried solely in **X'**

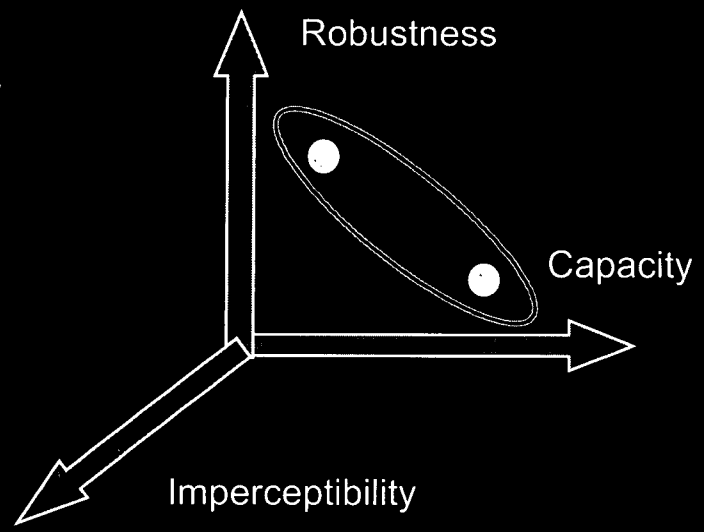


- Representative: odd-even embedding
  - high capacity but limited robustness
  - robustness achieved by quantization or tolerance zone

```
even  "0"
odd   "1"
```

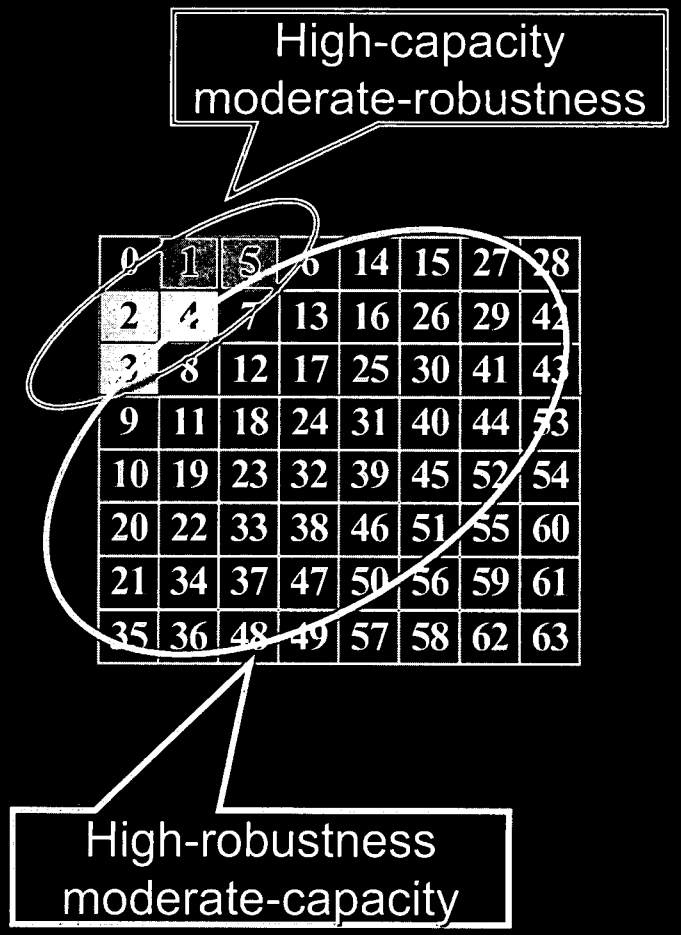
Why Not Multi-level?

- Previous data hiding targeted on single robustness-capacity pair
  - overestimation and/or underestimation of noise
- Multi-level data hiding
  - high rate embedding tolerate moderate processing
  - low rate tolerate more severe processing



Multi-level Image Data Hiding

- Block-DCT domain
- Low band:
  - relationship enforcement embedding
  - odd-even embedding with quantization
- Mid band:
  - spread spectrum embedding
  - biorthogonal modulation to encode multi-bit



Multi-level Image Data Hiding: Example 1

Panasonic Technologies, Inc.

- "PINTL" (35bits)

  survive JPEG ≥ 20%, LPF, additive noise

- 32 x 32 PINTL pattern (1024 bits)

  survive JPEG ≥ 45%

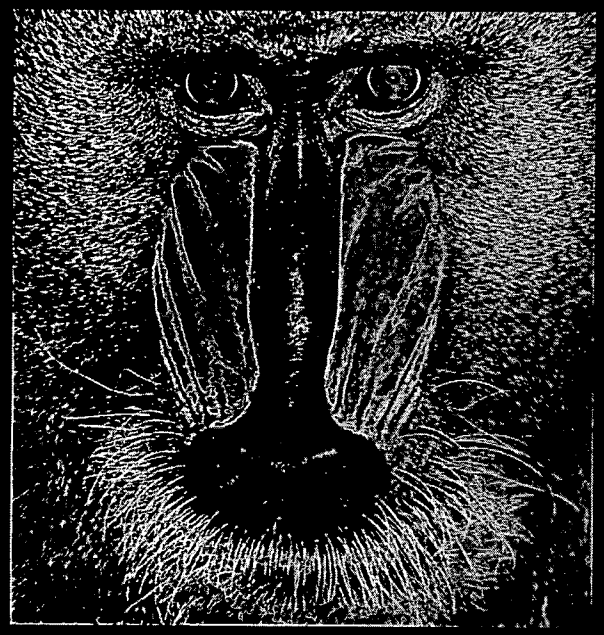
PINTL
松下

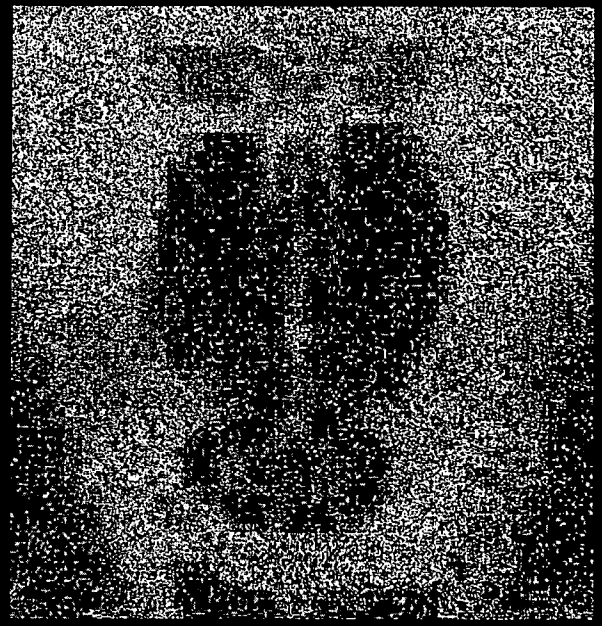
A

Panasonic Information and Networking
Technologies Laboratory

Multi-level Image Data Hiding: Example 2

Panasonic Technologies, Inc.





- "Panasonic Tech." (105bits)

  survive JPEG ≥ 20%, LPF, additive noise

- 32 x 32 PINTL pattern (1024 bits)

  survive JPEG ≥ 45%

PINTL 松下

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